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# MANGANESE DEFICIENCY OF PALMS

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Manganese deficiency is one of the most common micronutrient deficiencies of woody ornamental plants in Florida (1). It is common in alkaline calcareous soils and leached acid sandy soils. The acidity of the soil influences the availability of manganese to a greater extent than does the total quantity of manganese present in the soil (3). Manganese is most available to plants within a pH range of 5.5 to 6.5.

**SYMPTOMS:** Several species of palms frequency exhibit very characteristic and diagnostic symptoms of manganese deficiency. Because manganese is a mineral that cannot move from mature to young leaves, deficiency symptoms are more severe in young leaves (2). In palms, the symptoms are commonly referred to as "frizzle top" or "frizzle leaf". Terminal fronds are pale yellow, stunted, and are severely twisted and bent in a zig-zag or accordion-like appearance (Fig.1). The lower leaflets of the youngest fronds eventually die.

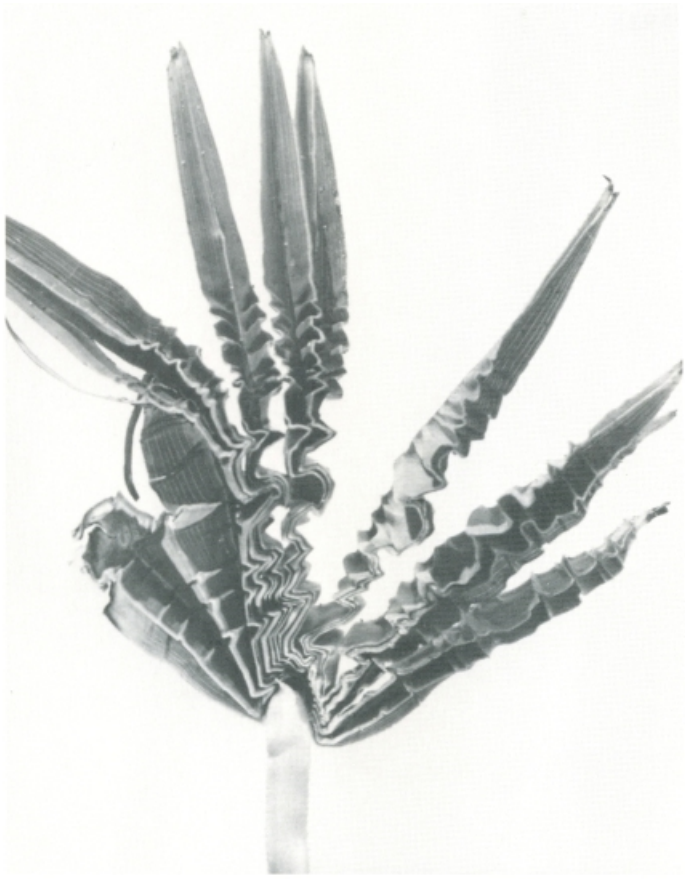

**Fig. 1**.Manganese deficiency of Windmill Palm, Trachycarpus fortunei (Hook) H. Wendl., showing the characteristic zig-zag appearance of young fronds.(DPI Photo No. 700860).

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**CONTROL:** Foliar sprays of chelated manganese have been effective, but, in general, soil applications of manganese salts, chelates, and fritted materials are longer lasting. Lowering the soil pH below 6.5 may also have some beneficial effect (2).

**SURVEY AND DETECTION:** Look for characteristic "frizzle leaf" symptoms, with youngest fronds having a twisted zig-zag appearance.

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